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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,481	06/28/2001	Hisataka Hayashi	03180.0282	3732

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EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/892,481

Applicant(s)

HAYASHI ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 9-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species I, Figure 3, filed August 29, 2003 is acknowledged. It is noted that applicant submits that claims 1-4, 6-12, and 14-16 are readable on Figure 3; however, claims 9-12 and 14-16 are not readable on Figure 3 and therefore are withdrawn from consideration since they are drawn to a nonelected species.

Specification

2. The disclosure is objected to because of the following informalities:
On page 7, line 2, shock absorber 119 should be referenced as shock absorber 117.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Since the optimum values of parasitic capacity(C) are not disclosed in the specification, it

is unclear to the Examiner what frequency(f) values satisfy this claimed equation $C < 1210 * f^{0.9}$. It should be noted in the specification on page 7, lines 24-32, the only value of C is 10 pH and thus values of 200 MHz or less satisfy the claimed equation. For purposes of examination, frequencies less than 200 MHz meet the claimed requirement.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yashima (U.S. 5,685,949) in view of Nozawa et al. (U.S. 5,255,153).

Referring to Figure 1 and column 6, line 51-column 7, line 40, Yashima discloses a plasma processing apparatus comprising: housing 12a, 12b; an RF plate electrode 30 placed in the housing and having a thickness of 1mm (col.9, lines 30-36); an opposite electrode 29 facing

the RF plate electrode; and RF power source 40 for applying a radio frequency to either the RF plate or the opposite electrode to generate plasma between the two electrodes (col. 7, lines 27-33).

Yashima fails to explicitly teach that a grounded housing.

Referring to Figure 1, Nozawa et al. teaches a plasma processing apparatus wherein the housing 2 is grounded 36. It is conventionally known in the art to ground a chamber to prevent electrical floating. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to ground the chamber of Yashima as taught by Nozawa et al. to prevent the chamber from electrically floating, which can alter the process conditions, thereby, ensuring repeatability of the wafers being processed.

8. Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa et al. (U.S. 5,255,153) in view of Yashima (U.S. 5,685,949).

Referring to Figure 1 and column 3, line 36-column 4, line 38), Nozawa et al. discloses a plasma processing apparatus comprising: a grounded housing 2, 36; an RF plate electrode 32 placed in the housing (col. 3, lines 64-67); an opposite electrode 12 facing the RF plate electrode (col. 3, line 67-col.4, line 2; and RF power source 10 for applying a radio frequency to either the RF plate or the opposite electrode to generate plasma between the two electrodes (col. 4, lines 27-30).

Nozawa et al. fails to teach an electrode thickness of 6 mm or less.

Referring to column 9, lines 30-36, Yashima teaches a plasma processing apparatus wherein the thickness of the electrode is 1 mm to ensure that the electrode has the necessary

mechanical strength. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the RF plate electrode of Nozawa et al. to have a thickness of 1 mm as taught by Yashima to ensure that the electrode has the necessary mechanical strength.

With respect to claim 2, the apparatus of Nozawa et al. further includes a radio frequency of 13.56 MHz (col. 4, line 27-30). Regarding the elected species Figure 3, it should be noted in the specification on page 7, lines 24-32 that the only value of C is 10 pH and thus values of 200 MHz or less satisfy the claimed equation.

With respect to claims 3 and 4, the apparatus of Nozawa et al. further includes a heat sink 26 that holds the RF plate electrode 32 and has a coolant passage and groove 24 inside it. (col. 3, lines 58-63).

With respect to claim 6, the apparatus of Nozawa et al. further includes a heat sink 26 which is supported by a part of the housing 14, and a shock absorber 20, made of an insulator, is inserted between the heat sink and the part of the housing 14 (see Fig. 1 and col. 3, lines 54-58).

9. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nozawa et al. (U.S. 5,255,153) in view of Yashima (U.S. 5,685,949) as applied to claims 1-4 and 6 above, and further in view of Hirano et al. (U.S. 6,120,661) and Sekiya et al. (U.S. 5,269,881).

The teachings of Nozawa et al. in view of Yashima have been discussed above.

Nozawa et al. in view of Yashima fail to teach that a heat sink is made of a ceramic material and a shock absorber is made of Teflon.

Referring to Figure 1a and column 11, line 19-column 13, line 10, Hirano et al. teaches a

plasma processing apparatus wherein the heat sink 12 is made of a ceramic material (col. 11, lines 32-36). By fabricating the heat sink of a ceramic material, stress is reduced and heat conduction is improved (col. 31, lines 41-50). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the heat sink of Nozawa et al. in view of Yashima to be made of a ceramic material as taught by Hirano et al. in order to reduce stress and improve heat conduction.

Referring to column 5, line 54-59, Sekiya et al. teaches a plasma processing apparatus wherein a shock absorber 62 is made of Teflon since this a suitable material to provide electrical insulation. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the shock absorber of Nozawa et al. in view of Yashima to be made of Teflon since this a suitable material to provide electrical insulation.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nozawa et al. '497 and Deguchi et al., '166 teach capacitive coupling plasma apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *me*

Alejandro
LUZALEXANDRO MULERO
PRIMARY EXAMINER